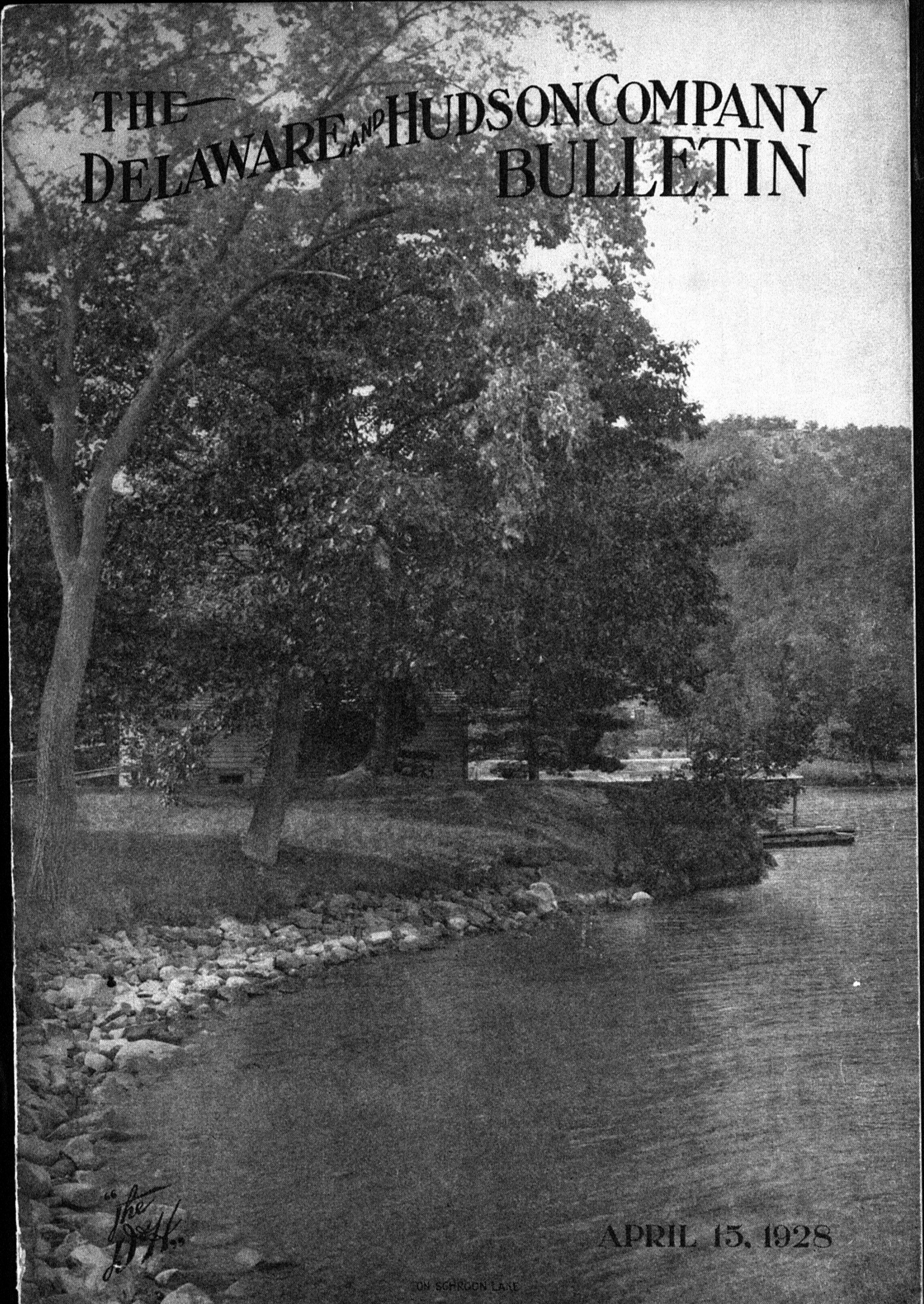
THE DELAWARE AND HUDSON COMPANY BULLETIN



"the D&H"

APRIL 15, 1928

ON SCHROON LAKE

One Hundred and Five Years

THE DELAWARE AND HUDSON COMPANY

April 23, 1823

The
DELAWARE AND HUDSON COMPANY
BULLETIN

Vol. 8 Albany, N. Y., April 15, 1928 No. 8

Would Like His Job Back

Veteran Mechanicville Car Inspector Enjoyed His Work So Well That He Would Seek Reinstatement If His Strength and Rules of the Company Permitted

FATE surely metes out some strange decrees. Were it not so, the scheme of life which places a big strapping fellow back of a soda or necktie counter and a little fellow, half his size, out in a railroad yard, would be reversed, perhaps. Likewise, many cases of the slender and the stout, the beautiful and the homely, the rich and the poor, et cetera.

JAMES LYTTLE

JAMES ("SKIP") LYTTLE, of No. 23 Mabbit Street, Mechanicville, N. Y., a retired car repairer and inspector, would never have become a railroad man if size had been the sole determining factor, for he's a little fellow; well built, but little, nevertheless. Yet his record of thirty-five years and ten months of continuous service indicates that fate, as strange as its decrees may seem, did not misplace him. He was retired on April 1, 1922.

Mechanicville has always been his home. He was born at School and Railroad Streets, where his father for many years conducted a cafe, on February 28, 1853, third youngest in a family of seven children. The building afterwards was enlarged by a brother and is now the Hotel Ellsworth.

Railroad work, however, was not his first choice. Instead, his fondness for horses placed him in the employ of George Lockwood, a local liveryman, with whom he remained for fourteen years. He purchased for Mr. Lockwood, the first two-horse coach used in the village. The livery business was good in those days and the stable boasted of twelve splendid horses and vehicles for every purpose. But the day came at last when Mr. Lockwood sold out and bought a grocery business.

Store work did not offer the promise of action that he craved and so he parted company with Mr. Lockwood and turned to the railroad. Meeting the late J. H. Cowan, then the local car foreman, on the Broadway crossing one morning, he asked him for a position and was accepted without further formalities. He was put to work at once, with Bill Kerwood, in the yard close to the crossing. In those days there was a car shop, seventy-five to one hundred feet long, at the end of Mabbit Street, which housed the blacksmith shop, material racks, and the foreman's office. It was long since torn down. A roundhouse had not been built at that time and the only locomotive, a switcher, to tie up there was kept on a track between The Delaware and Hudson and Boston and Maine yards.

Later he worked in the upper yard and then in the middle yard. His aptitude for the work soon won him promotion to the position of foreman in the upper yard, although for thirty years prior to his retirement he was an inspector. He worked under Albert Patrick, who succeeded Mr. Cowan, and for D. C. GAGE, the present foreman, who followed Mr. Patrick and later was chief joint inspector which position was abolished more than a year ago.

His experience ranged from the problems presented by wooden brake beams and shoes to those common to the more modern equipment of today. He enjoys the distinction of having "put out" of the Mechanicville yard the first train equipped with air. Trains then averaged from thirty to thirty-five cars and those with air brakes were placed next to the locomotive, which practice often required a considerable amount of switching. A locomotive, as he recalls, was considered as equivalent to the braking power of seven cars.

It has always been his good fortune to be a keen observer. As a result, he is conversant with Mechanicville when the locality where he lives was farm land owned by Truman Mabbit, an early agent in the service of the Company, for whom Mabbit Street was named. As indicative of the strides which Mechanicville has made since he purchased his home some forty years ago is the fact that the street is now built in on both sides. His first school tax assessment was twenty-five cents and his last, thirty-two dollars.

Mabbit was an agent when the juncture of Park Avenue and Railroad Street was the hub of local railroad activities. His son, as he recalls, was the baggagemaster. Opposite and somewhat to the north of the station was the freight house, while on the same side and directly north was the wood shed where wood fuel for locomotives was stored and where a "big Dutchman" came from Saratoga Springs, and cut the four-foot lengths of wood in two. The water supply for locomotives was brought down from a spring on what was then known as the Seymour farm, by a lead pipe that fed a well which had been dug for storage purposes and from which the water was, in turn, pumped into an elevated tank. Such locomotives as the *Farewell* and the *Knickerbocker*, in charge of Sam McMullen, Jake Myers, or others of their day, frequently stopped there.

Like many another veteran of the service, he rues the fate that tore him away from his work. Scarcely could he have avoided it, since never during his long career did he suffer a serious accident. He would go back today, the rules of the Company permitting, if he had the strength. He says this himself.

His married life covered a period of forty years, his wife, nee Jennie Dalton, of Mechanicville, having died seven years ago. Four of their children are living and it is with a daughter, Mrs. Anna E. McGowan, that he makes his home.

He is a member of St. Paul's Roman Catholic church of Mechanicville and of The Delaware and Hudson Veterans' Association.

The Railroad as a Barometer

DID you ever think of the railroad as a barometer that indicates the trend of business and the likes and dislikes of the public. The former we know to be so as a result of fluctuations in the flow of traffic, but what of the latter? A study just completed by the Bureau of Railway Economics as to rail shipments during the past ten years, of sixteen principal fruits and vegetables grown in this country, affords us a reading which discloses a revolution in the eating habits of our people, to the extent that the consumption of fruits and vegetables by the American public is now almost twice what it was ten years ago. In the years just preceding 1920 our consumption of fresh fruits and vegetables amounted to an average of about 478,000 carloads a year. For the past three years this annual average has been 848,000 carloads, an increase of 77 per cent. Staples like potatoes, lemons, cabbage and onions have increased less than the above amount; but fresh lettuce, for instance, increased 440 per cent; grapes, 216 per cent; grapefruit, 202 per cent, and celery, 188 per cent.

From one point of view this revolution in the eating habits of the American people has taken place upon the advice of our doctors, based upon our much greater knowledge of food values. From another point, it has taken place because the railroads through their development of the refrigerator car and the quickening of rail service have abolished the necessity of relying upon one's own garden, or upon the produce of nearby territory. Today the city dweller in the northern part of the United States may be said to have his garden throughout the winter in states as far removed as Texas, California and Florida.

He: "Do you believe in the power of prayer?"

Bored Flapper: "Would if you'd gone home an hour ago."—*Exchange.*

'Twas Called A Dream

Successful Completion of the Moffatt Tunnel, One of the Greatest Engineering Feats in the History of Our Country, Recalls Its Interesting History

"THEY said it couldn't be done, but David Halliday Moffatt did it," might properly be inscribed over the portals of the recently completed Moffatt tunnel on the Denver & Salt Lake railroad, sixty miles west of Denver, Colorado. Although he died in 1911, it was his dream, a dream that cost him a fortune, caused far-seeing railroad men to look askance, and bankers to forsake him, that pointed the way to the successful accomplishment of one of the greatest engineering feats in the history of our country. If, in truth, Moffatt was a dreamer, he dreamed well as developments have proven.

To him there was nothing of a dream about the project to pierce the Continental Divide. It was something very real, practical and possessed of wonderful possibilities, despite the many obstacles, both physical and financial, that crept into the picture. He had an ambition to give Denver the advantages of a transcontinental railroad. The city had been left off the line of the Union Pacific and had suffered severely as a consequence, but had bravely recovered from its great disappointment. The slight, however, was not soon forgotten.

Moffatt was one of the city's pioneers, therefore his great desire to see it prosper. Although a native of Washingtonville, Orange County, New York, where he was born on July 22, 1839, he had adopted Denver as his home on March 17, 1860. It then was known as Denver City and had a population of not to exceed 1,200 souls. Except to return to Mechanicville, N. Y., where on December 11, 1861 he married Fannie A. Buckhout, he seldom left the city so occupied was he with mining, banking, railroad and political affairs in which he became prominent. These activities returned him a fortune estimated at from $8,000,000 to $10,000,000.

Following the Union Pacific's decision to pass up Denver, his vision of a tunnel through the Great Divide was ever with him. As an initial move to give Denver a transcontinental railroad he began the building of the Denver & Salt Lake railroad and on December 31, 1902 turned the first shovel of earth on the grade near the city. His friends believe that had he lived he would have pushed it through to Salt Lake City. At the time of his death, however, only 200 miles had been built but it has since been completed to Craig, Colorado. In this work he recognized the great need of the tunnel but, lacking funds to build it, ran his railroad over a so-called temporary route through Rollins Pass at an elevation of 11,600 feet above sea level and involving a four per cent grade for a distance of twenty-seven miles. Severest of winter conditions, particularly in the pass and at Corona—the "top of the world"—where passengers in summertime have experienced the novelty of throwing snowballs, seriously handicapped operations on this line for at least nine months of the year. In the elimination of these difficulties the tunnel is of immediate importance.

When Moffatt died, however, it was feared that the tunnel idea had passed with him, but not so. He had so imbued his friends with it that this was impossible. One effort after another to obtain money with which to carry on the work failed, but the Pueblo flood gave them the opportunity to appeal for State aid in behalf of the people of Pueblo county and this brought the support they needed so badly. Under Governor Oliver H. Shoup a tunnel commission was created and a sale of bonds authorized. Bills covering this legislation, which made it possible to finance the work with taxes paid by property holders in a so-called "Tunnel Improvement District" embracing the city of Denver and a large part of the northwestern section of the state, were passed in 1922 and by the fall of 1923 the necessary funds with which to proceed with the work had been raised. Actual construction began in September of that year, and the first train passed through the tunnel on February 26, last.

Six and two-tenths miles in length, the bore pierces the Great Divide, under James peak, at an elevation of 9,200 feet and is the longest of its kind on the North American Continent. It cost $18,000,000 and has been leased to the Denver & Salt Lake railroad for fifty years at an annual rental of from $329,660 to $536,740 for the first thirty-six years, with the privilege of extending the lease for forty-nine years or sub-letting its right to the exclusive use of the route.

Great physical obstacles were naturally encountered. Three underground rivers were uncovered in the east tunnel. Pumps with which to drain them dry had to be installed at an enormous expense. On the west side soft earth presented still another problem. Approximately 750,000 cubic yards of rock were removed; 28,000,000 kilowatt hours of electrical energy consumed in driving machinery, and, it is estimated, drill holes made in solid rock would easily total no less than 700 miles. Other data is equally as astounding.

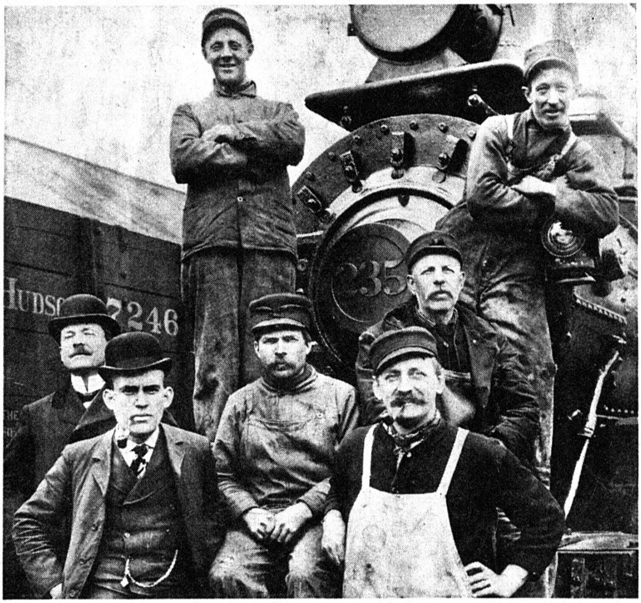
If We'd Only Pause and Think

LIFE'S trials we could soften
If we'd only pause and think;
Tears would not flow so often
If we'd only pause and think.
Our skies would all be brighter,
Our burdens would be lighter,
Our deeds would all be whiter
If we'd only pause and think.

We would not walk so blindly
If we'd only pause and think;
We would not speak unkindly
If we'd only pause and think.
Unrest we would not borrow,
Darkly clouding each tomorrow;
We could banish worlds of sorrow
If we'd only pause and think.

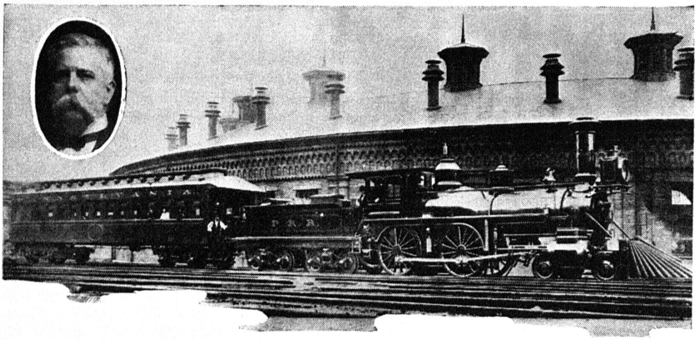
—SELECTED.

Cohoes-Waterford Crew, 1902



COURTESY H. W. SHAMBO

Those standing on the ground are Thomas Burke, Standard Oil representative; Charles W. Shambo (deceased), conductor; Fred Collier, trainman, now employed at "JA" tower, Livingston Ave., Albany; and W. C. Whish (deceased), engineman. On the pilot deck are Fred Jones, trainman on Nos. 9 and 10; Edward Fairchild, locomotive fireman, now employed in the Colonie yard; and Theodore Vanderwerken (deceased), a trainman.



First Locomotive and Coach Equipped by George Westinghouse with Compressed Air Power Brakes — 1869
(Insert) Mr. Westinghouse

Born Of A Head-on Collision

George Westinghouse, a Native of Central Bridge, Believed Mishap Could Have Been Prevented, and Thereupon Conceived the Air Brake

By W. J. COUGHTRY, *Recorder*

THE air brake, one of the greatest advances in the art of transportation, was invented and developed by George Westinghouse, a native of Delaware and Hudson territory, who was born at Central Bridge, New York, on October 6, 1846. This invention resulted from a head-on collision on the Schenectady and Troy Branch of the New York Central in 1866, which Westinghouse believed could have been avoided had proper braking power been available. His first brake, a buffer type, was soon abandoned. The second design, a chain type with a steam cylinder under the locomotive for tightening the brake chain, he discarded for a more practical type with an independent brake cylinder under each car supplied with steam from the locomotive by a continuous pipe with flexible couplings between the cars.

While at work in his shop in Schenectady on the problem of condensation of the steam, a magazine article describing the operation of rock drills worked by compressed air came to his attention and diverted his efforts to the utilization of that force for transmitting power from the locomotive to the brake mechanism on the tender and each car. Embodying his ideas in a set of drawings he applied for a patent on July 10, 1868. The first apparatus, known as the straight-air brake, which he had made in Pittsburg, was applied to a locomotive and three cars on the Pennsylvania Railroad which were first operated out of the Union station in Pittsburg in September, 1868, in the "Steubenville Accommodation" train. The successful operation of this train resulted in the grant of a patent to Westinghouse on April 13, 1869.

The accompanying photograph, reproduced by courtesy of Mr. H. H. Westinghouse, shows locomotive No. 13 and one of the six cars of the Pennsylvania Railroad which composed the train upon which the next installation of the air brake was made. This train, placed at the disposal of the Association of Master Mechanics, then in session in Pittsburg, was subjected to the most severe tests on mountain grades on the Pennsylvania between Pittsburg and Altoona and established the efficient braking control of trains by compressed air. A second successful demonstration on the Pennsylvania at Philadelphia in No-

(*Turn to Page* 125)

The
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BULLETIN

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Vol. 8 April 15, 1928 **No. 8**

Where is the heart that doth not keep,
Within its inmost core,
Some fond remembrance hidden deep,
Of days that are no more?
—Ellen C. Howarth.

That Aladdin Lamp

WHAT sort of an Aladdin lamp do we possess? Twice each month a sum of money, called wages, is placed in our hands. From whence does it come? Most of us see naught but the tremendous outgo, and naturally wonder what it is that stems this flow. Other businesses, we know, derive their revenue from various related items or sources, whereas a railroad, as a carrier of freight and passengers, has but two. Just two revenue sources—freight and passenger earnings!

Railroad employes invest their labor as against Management's capital in the business in which they are jointly concerned. Considering the enormous machine, if such it may be called, needed to carry on this business, Management's investment is the larger by far and in 1926 (the last figures available) amounted to $13,652 per employe. This fact, however, should in no sense weaken the employe's proprietorial interest in the business. He should, be so deeply concerned with its success as to seriously regard it as belonging entirely to him. Our interest in the immediate and future success of The Delaware and Hudson should be of that same healthy kind.

This interest should also lead us to seriously consider our vital dependence upon the freight and passenger earnings accruing to *our* Company. It will be exercising nothing less than good judgment if we recommend *our* road to our acquaintances and patronize those merchants and other business people, who, in turn, patronize us. If by purchasing a suit of clothes, a bill of groceries or furniture, a ton of coal, or anything else, of one of our patrons, we can be assured that we have increased *our* Company's tonnage and, incidentally, its revenue, even that little, we have done no more than we owe ourselves in our own interests, individually and collectively. To go outside the circle of Delaware and Hudson patrons in transactions of this kind is but to hasten the day when we may be obliged to seek employment elsewhere because of waning revenues. This is not a threat; merely the citation of a possible natural consequence.

Let us all rub the Aladdin lamp with the oil of employe loyalty, industry and enthusiasm and the genii we crave so much will surely appear and grant our wish for continued friendly and remunerative relations.

Differences of Opinion

By GUY E. SAMPSON

A CARPENTER stopped a moment to gaze
At a freight train passing by,
He envied the brakeman who sat on top,
And as he turned they heard him sigh,
"Nothin' to do but sit and look
At the scenery whizzin' by
With an occasional stop at a water tank
When the engine gets too dry.
I wish I had taken a job like that
When I was young and spry."
The engineer said, as he gazed at the man
Who worked with the saw and plane
"Now there is a man who is far better off
Than any man on this train.
He sleeps every night 'neath the very same roof
He is home with his family each night.
That's what I call takin' pleasure in life
There's not a 'Rail' but will say that I'm right."
The blacksmith said, as he drove home a nail
In the shoe of the farmer's horse
"I wish that I owned a team like this
And a farm to work with them, of course."
But the farmer replied, as he bit off a chew
From a plug he removed from its sack
"I wished I'd learned the blacksmith trade
For with the farmers, business surely is slack."

MORAL: What's the use of kicking about
The job that we've chosen to do,
Why not do our best, then say to the rest
I never would trade jobs with you.

Despite his two billions of dollars, we have an advantage, at least, over Henry Ford on days when the income tax folk make their calls.

Never make yourself miserable, as so many people do, by regretting a decision.—From *"In Black and White."*

Stephenson and His Son

Their Notable Contributions to the Development of the Locomotive and the Railroad, As Cited by Intimate Acquaintance, Form a Most Interesting Chapter

(Continued from Last Issue)

AFTER Stephenson became engineer to the different collieries of the partnership, viz., Killingworth and Long Benton, in the County of Northumberland; and Mount Moor, Darwent Crook, and South Moor, in the county of Durham, he made several improvements in the machinery of those collieries; and, in particular, in first of all applying an underground engine, then employed to pump water, at Killingworth, to drag the coals up a sloping plane from the dip side of a downcast dyke of twenty fathoms, and this was one of the earliest engines so employed underground.

"Subsequently, an extension of the application of using fixed engines to drag the coals from the dip workings of that colliery was adopted, two other engines were applied, which, together with the original engine, conveyed the coals by sloping planes from a distance of nearly two miles, and raised the water by sliding spears from a depth of eighty-three fathoms below the level of the bottom of the pit. This was the most extensive system of engine planes underground in the trade at that time, the furthermost engine being 1,500 yards distant from the pit, the smoke of the boilers being conveyed along flues the whole distance. In the construction of those engines, and in the application of them to such operations, a mass of engineering skill, invention, and perseverance was displayed; which could only have been accomplished by a person of very superior mind, at the early age at which Stephenson performed such feats of skill.

"Stephenson also introduced the employment at Killingworth of tram-roads, with small carriages or trams, pushed by boys, on which the coals in the corves or baskets were conveyed from the extremity of the workings to the main roads, instead of ponies with sledges. A great saving of expense was thus accomplished, between the employment of ponies and sledges, and boys with trams on tram-roads. Since the introduction of round top rails, however, ponies are again universally used in preference to boys; such are the vicissitudes of improvement. I could easily adduce several cases of improvements by Stephenson in the machinery connected with the working of those collieries, but it would extend this address to a greater length than advisable; I can only, therefore, give the most important matters connected with such subjects.

"The most prominent measures which the two Stephensons have brought to perfection, and which will identify them with posterity, are Railways, Locomotive Engines, and the Safety-lamp. The two first of these have priority in point of time, but, as they have been the result of the life-time of both the Stephensons, beginning in 1813 and ending in 1859, and as the safety-lamp was an episode of a few months only in the year 1815, I shall, first of all, detail the incidents connected with the invention and perfection of the Safety-lamp by the elder Stephenson; by this arrangement the narrative of the progress of the improvements of Railways and the Locomotive Engine will not be interrupted.

"I have already stated, that George Stephenson was appointed engineer to the partnership collieries in 1812, and that some short time afterwards he applied the underground engine at Killingworth to drag the coals up a sloping drift; this plane crossed a slip dyke of twenty fathoms. In the fissure of the dyke there was a blower, or considerable discharge of the carburetted hydrogen or inflammable gas of the mine, which Stephenson passed every time he inspected the machinery of the plane. Accidents were then very frequent in the mines of Northumberland and Durham, by explosions of the inflammable gas; and as the workings of Killingworth colliery discharged more than an average quantity of gas, it was, in mining language, 'a very fiery colliery;' and as the only light then used in an inflammable mixture was the coruscations of steel from flint, by what was called the 'steel mill,' which was an exceedingly pale light, and also required a boy to work the mill for every man working by its light, and being thus exceedingly expensive, as well as being a very imperfect light, the attention of all reflective minds was directed to provide a more perfect and less expensive light.

"The repeated explosions likewise, by which numerous lives were sacrificed, and particularly an explosion at the Felling Colliery in 1812, by which ninety men and boys were lost, and a similar accident the year after at the same colliery, had, with more than usual intensity, drawn the attention of scientific men to the subject of a safety-lamp, to be used in inflammable mixtures of gas. Without troubling the Institute with unnecessary details of the labours of the various persons so devoting their time and inventive genius to this object, it is sufficient to say that Dr. Clanny, a physician of Sunderland, produced a lamp in 1813, which could be taken into an explosive mixture with impunity. Dr. Clanny insulated the flame of the lamp by water, and the surrounding air, and, of course, the inflammable air, when the lamp was placed in such a mixture, being forced through the water by a bellows, so that when an explosion did take place within the lamp it was prevented from passing outwards by the interposed water. This lamp, however, it is obvious, could not be made generally useful in working mines subject to constant discharges of gas, having, besides its size, to be attended by one person, as in the case of the steel mill, for every workman at work.

"As may be supposed from Stephenson's well known habits of thought and application, he also applied his fertile mind to the invention of a safety-lamp; and, without going into unnecessary details of all his schemes of a safety-lamp * * * I shall relate * * * the steps taken by him in the invention of the successful lamp.

"I have already stated that a blower, or considerable discharge of gas, existed in the engine plane at Killingworth Colliery, and as the fresh air passed down the drift the gas could be lighted at any time with impunity. Stephenson frequently lighted the gas, and observed when it was lighted at a distance from the exit of the blower, that the flame took a certain time to pass from where it was lighted to the aperture from which the gas issued, but, from there being a strong current of air in the drift, the flame was kept at a distance from the aperture, and when the area of the drift opposite the blower diminished, so as to produce a very strong current, the flame of the blower could be kept at a considerably farther distance from the mouth of the blower; and, that on still further diminishing the area of the drift, he could drive back the flame from the orifice until the mixture of gas with the atmospheric air was not explosive, and when, in fact, the flame became extinguished. It occurred to him then * * * that if he could produce, through a tube admitting the air into the interior of the lamp, such a current as would keep back the flame of an explosive mixture, when ignited by the flame of the lamp, in the same manner as the current of air of the drift kept back the flame of the blower from the aperture, he would have a safety-lamp.

"He found, likewise, that holding a lighted candle to windward of the lighted blower, the azotic gas from the candle had a powerful effect in extinguishing the flame, and that when he produced a quantity of azotic gas from two or three candles, he could extinguish the flame of the gas altogether. This circumstance, he also thought, might be brought to bear upon the safety of a lamp. Many were the experiments we made at this blower. We also commenced a series of experiments in my house at Killingworth with a glass receiver and pneumatic trough, to ascertain the velocity of ignited gas through small tubes. By filling the receiver with explosive gas from the pit, and inserting successively glass tubes of different diameters in the top of the receiver, and by filling the pneumatic trough, and so raising the water within the receiver by means of a cock, we could produce a current of air through the tube at the top, at any velocity we pleased. We then lighted the gas at the top of the tube, and, by experience, found that when the gas was so ignited, and a current of air produced of a certain velocity, we could keep the flame from passing downwards into the interior of the receiver, and knowing the area of the tube, and the quantity of water poured into the trough in a given time, we thus ascertained what velocity, with a given area of tube, would prevent the flame from passing downwards.

"In one of these experiments, however, we had, to us, a serious accident, which might have been more so. The experiment was going on very satisfactorily, the tube being about six inches in length above the glass receiver, and we were keeping the flame dancing up and down in it without passing into the receiver, as we poured more or less water into the trough. We did not then know that glass tubes when heated passed flame through them with more facility than when cold, and, in conducting the experiment, in an instant, the flame passed into the receiver which blew up, first to the ceiling of the house, and then fell into atoms, while we were standing alongside of it. This, however, did not deter us from continuing the experiments; the glass being very expensive we had a deal box made with windows of glass, which answered the purpose very well.

"At last a lamp was constructed with a tube in the bottom, through which the air was admitted into the interior of the lamp, and a chimney to produce sufficient draught of air, through such tube, to prevent the ignited gas from passing downwards, and with a slide to regulate the quantity of air admitted into the lamp, so as to produce a greater or less velocity, as might, by experience, be required to keep back the flame. This lamp was tried at a blower on the 21st of October, 1815. There is a very pretty story in Smiles' book of this trial, which it is almost a pity to even partially destroy, the danger, however, in reality, was not quite so great as there represented; the box, or cabin, in which the lamp was tried was not of such dimensions as would, if an explosion had taken place, have produced the effect there described, a small quantity of gas was only required, and we had had sufficient experience not to employ more gas than was necessary; at most, an explosion might have burnt the hands of the operator, but would not extend a few feet from the blower.

"The result of the trial with this lamp was, that when the slide was sufficiently closed, so that the external air, though explosive, did not, when ignited within the lamp, pass through the aperture, there was not sufficient atmospheric air admitted by such opening to support combustion, and the flame of the lamp was always extinguished. Other lamps were made, with two or three holes of the requisite dimensions, which, though the flame was extinguished when plunged into an explosive mixture, retained their light longer than the single tube lamp. It occurred to Stephenson then to use several tubes, and last of all, perforated plates, through the holes of which the explosive air was admitted to the lamp, but which did not allow the flame to repass when exploded within, and these lamps retained the light within, even when the mixture was such as to produce continuous flame, but which, after a short time, was extinguished, as Stephenson explained, by the quantity of azotic gas accummulated in the lamp.

"This was, then, a complete safety-lamp, which could be taken into an explosive mixture with impunity, the principle being, that the air was admitted through perforated orifices, so small in size that the explosion in the inside of the lamp, when an explosive mixture was admitted, did not pass outwards through such holes. In fact, it was inadvertently arriving at the discovery that explosions of carburretted hydrogen of gas would not pass through holes or tubes of a certain size.

"It is not my wish to raise up a question, which has been long set at rest, as to the claim which was at the time made by the admirers of Sir Humphrey Davy, on the one hand, that he was the first to discover this principle; and, on the other, the claim that Stephenson was the first discoverer of such principle. The almost unanimous conclusion of all persons is, that both Davy and Stephenson were original and separate discoverers of the principle, and I only now revert to it that I may add my concurrence in such a conclusion, and to shortly state the facts which have led me to such a decision.

"I have already stated, that in 1815, Stephenson had, together with myself, been making experiments with the blower at Killingworth, I may now add that in August of that year he communicated to me the principles on which he thought a safety-lamp might be constructed. In the beginning of October I made a plan of a lamp, which was given to Hogg, a tinman at Newcastle, to construct; this lamp was delivered to Stephenson on the 21st of October, and tried in the Killingworth pit on the 21st of October, 1815. I had, throughout the whole time that Stephenson was engaged in considering the various modes by which a safety-lamp might be constructed, and the principles on which such a lamp should be based, been so ultimately associated with him, that there was no step taken by him, in word, thought, or deed, with which I was not acquainted; and I can vouch, that from the period when he first directed his attention to the subject, up to the time when his lamp was tried in the mine, he had never been informed that Sir H. Davy was engaged on a similar enterprise. I am quite certain if he had, I should have been made acquainted with such a circumstance.

"His discovery was the result of the process pursued in the investigation of the principles which he thought constituted the basis of a safety-lamp, and which, as he explained, though they did not constitute, they led to the important discovery. I may add that as a testimony and reward for my part in the investigation, Mr. Stephenson presented me with a silver tankard, a facsimile of that presented to him, with the following inscription: 'Presented to Mr. Nicholas Wood, of Killingworth, by George Stephenson, as a grateful testimony of his many obligations for the indefatigable zeal and exertion displayed in assisting him to elucidate the principles, and bring to perfection the Safety-Lamp, which, under the auspices of R. W. Brandling, Esq., attained the sanction of the most respectable gentlemen of the neighbourhood. May, 1819.'

"Sir Humphrey Davy's attention having been drawn to the subject by the South Shields Committee, wrote to the Rev. Mr. Hodgson for some fire-damp, and on the 15th of October, 1815, acknowledged the receipt of the fire-damp, and on the 19th informed Mr. Hodgson that he had discovered that explosion would not pass through small tubes. The whole of the process which led to the discovery of the Davy-lamp is given at length in a pamphlet published by Sir H. Davy in 1818, and it only requires a perusal of this pamphlet to see that the process which was pursued by Sir H. Davy was essentially different from that pursued by Stephenson. The former was investigating the chemical properties of the gas, while the latter was engaged, for months previously, in investigating the mechanical effect of the inflammable air in a state of flame; first of all at the natural blower of gas, and next in its passage through small tubes; and both made the discovery almost at the same time, but by entirely different and distinct processes, that fire-damp in a state of flame would not pass through small tubes or small perforations; and it may be observed, that in both cases, the process by which they arrived at the respective conclusions, involved a considerable duration of time. The dates of the progress made by each of those gentlemen in the investigation show this most clearly; and I, therefore, arrived at the conclusion that they were parallel inventors, and that if we had not had a Davy, we would certainly have had a safety-lamp, and that if we had not had a Stephenson, we would as certainly have had a safety-lamp.

"It is scarcely necessary for me, in presenting these observations to such an Institute, to pronounce on the value of such a discovery, or to point out the merits of the two inventors. Davy had, certainly, as a thoroughly scientific man, a great advantage over Stephenson, the merit of the latter, therefore, becomes all the more meritorious by the contrast, and following so closely upon his performance of the improved Newcomen engine, and his then proceedings with regard to railways and the locomotive engine, he at once established for himself a name as a thoroughly practical man of genius and perseverance.

"While the safety-lamp experiments were going on, his son was about twelve years of age, and at school at Mr. Bruce's academy, at Newcastle-upon-Tyne.

"I must now revert back to the period when Stephenson was appointed engineer to the partnership colleries, and to the commencement of his labours on railways and the locomotive engines."

(To be continued in Next Issue)

Veterans to Meet in Wilkes-Barre

"ON to Wilkes-Barre," will be the slogan of The Delaware and Hudson Veterans' Association from now until Sunday, April 22, when its members will meet in the Savoy theater in that city, at 2 p. m., for their second regular quarterly meeting of the year. All members are urged to attend this meeting and a cordial invitation is extended to veteran employes generally, to join them. A short entertainment program is being arranged by N. S. **Burns**, a member of the executive committee for the Pennsylvania division. W. T. **Campbell**, president of the Association, will preside.

A special train will leave Albany at 6:45 a. m., for the convenience of members on the northern divisions, and will carry a dining car. Breakfast, luncheon and dinner will be of the same high order as on previous occasions and will be served at the same prices that have prevailed heretofore, i. e., fifty and seventy-five cents. The train schedule is as follows:

Leave	Albany	6:45 A. M.
	Elsmere	7:01 A. M.
	Delmar	7:04 A. M.
	Slingerlands	7:07 A. M.
	Voorheesville	7:13 A. M.
	Meadowdale	7:18 A. M.
	Altamont	7:24 A. M.
	Delanson	7:42 A. M.
	Esperance	7:49 A. M.
	Schoharie Junction	7:56 A. M.
	Central Bridge	7:58 A. M.
	Howe's Cave	8:05 A. M.
	Cobleskill	8:16 A. M.
	Richmondville	8:26 A. M.
	East Worcester	8:40 A. M.
	Worcester	8:49 A. M.
	Schenevus	8:58 A. M.
	Maryland	9:04 A. M.
	Colliers	9:13 A. M.
	Oneonta	9:25 A. M.
	Otego	9:39 A. M.
	Wells Bridge	9:47 A. M.
	Unadilla	9:55 A. M.
	Sidney	10:03 A. M.
	Bainbridge	10:10 A. M.
	Afton	10:18 A. M.
Leave	Nineveh	10:25 A. M.
	Windsor	10:49 A. M.
	Lanesboro	11:05 A. M.
	Carbondale	12:15 P. M.
	Olyphant	12:34 P. M.
	Green Ridge	12:42 P. M.
	Carbon St. Jct.	12:44 P. M.
	Hudson	1:18 P. M.
Arrive	Wilkes-Barre	1:30 P. M.

Safety First In Australia

WHILE Safety First may be considered an American institution it is fast becoming a world-wide movement. In a recent letter to J. E. Long, superintendent of safety, C. H. Holmes, chairman of the betterment and publicity board of the Victorian Railways of Australia, tells of the work being done in the interest of Safety First in that far-away country, and in particular of the manner in which it is being conducted among the employes of the railroad whereon he is employed. All that he writes is very interesting, indeed, but space does not permit reprinting his letter.

Twenty-two safety committees, with an aggregate membership of 800, are functioning throughout the state, their work being augmented by the use of posters prepared by the National Safety Council of America, and depicting some local hazard, conspicuously displayed on bulletin boards; by pamphlets dealing with the "safe use of ladders," "artificial respiration," and relevant subjects; through employe publications, and the use of motion pictures. District committees meet every two months and the Safety Council as often as practicable, or on an average of once every two months, also.

"No accident" drives among shop employes have proven most successful. In one shop where 470 men are employed, such a campaign resulted in a complete elimination of accidents during the period. Other shops of smaller forces have done equally as well.

An effort is likewise being made to educate the public in respect to the dangers to be encountered at grade crossings (level crossings, they call them in Australia). Annual campaigns are held during which time posters especially prepared are displayed at all railway stations, grade crossings, and in garages and other business places. These are also reproduced in miniature and, together with a pamphlet of pertinent suggestions, are distributed throughout the country in an effort to bring their message to the attention of owners of motor cars and other vehicles.

And last but not least is an effort that is being made to implant Safety First truths in the minds of school children. For this purpose an active campaign is being carried on and once each month Safety bulletins are distributed to the various state, private and denominational schools, and in addition, a Safety supplement is enclosed in each issue of a school paper prepared for senior grade scholars.

Recently the National Safety Council of Australia was formed in Melbourne and is now actively engaged in endeavoring to educate the public as to the dangers associated with street intersections.

Sleep

SLEEP is the most important thing in the world, more important even than food. For we eat to sleep—but we sleep to live. Men have gone sixty-three days without food and a week without water—but they cannot last more than ten days without sleep.

"Loss of sleep, causes a form of starvation, for the food we eat is digested and transmitted into new muscle, brain, blood, and nerve-cells only while we are asleep. Endurance-racers prove this. Those engaged in six-day bicycle races and other witless forms of diversion eat four or five times as much food as does the ordinary man. Yet the end of the contest finds them hollow-eyed and cadaverous from the loss of sleep more than from the physical exertion.

"Sleep recharges the exhausted body-batteries and fills the organic furnace with fresh fuel. Sleep is a positive process—not a negative one. It isn't merely a stopping of bodily activity. It's the substitution of a constructive process for a destructive one.

"Only while we are unconscious do we fully recuperate. The deeper the sleep, the quicker the recuperation. The lighter and more disturbed the sleep, the more we need of it, the longer it takes to effect repair."—*Clinical Medicine.*

Born of a Head-on Collision

(Continued from Page 119)

vember, 1869, with a train of ten cars, was followed by others at Chicago and Indianapolis. The adoption of this device was so rapid that by 1875 the passenger trains of nearly all the principal roads were fully equipped with the Westinghouse air brake.

The transition from the straight-air to the automatic air brake occurred on March 5, 1872, when Westinghouse brought out the triple valve attachment. His development of the quick-acting brake in 1886, which acted instantaneously on each car upon its application, and upon each part of a train in case of accidental parting, led to its universal application to freight equipment.

It is a valuable asset in life to have happy recollections.—From "*In Black and White.*"

Safer Than At Home

[W. C. Cartinhour, Vice-President of the Provident Life and Accident Insurance Company, in the Chattanooga (Tenn.) Times]

WHEN the number of railway passenger trains operating throughout the United States every day is taken into consideration, and the millions of persons riding thereon as passengers, the percentage of death losses resulting from wrecks is almost nothing at all.

On the other hand, a person is daily subjected to all kinds of accidents in the home—falling down steps, chopping off fingers and toes, stepping on nails and bumping heads in dark basements, slipping on the bathroom floor, touching live wires, punching out eyes in play and suffering countless other mishaps of this character. Some of these accidents have fatal results, some produce lasting injuries and others cause only temporary pain. On the street, one runs the daily risk of being hit by an automobile, a hazard that is growing greater year by year, and, in addition to that, there are lots of other things that can happen, like being hit by flying missiles, objects dropping off buildings, falling signs and one thing and another.

The difference between these two classes of risks—those incurred while riding as passengers on trains and those involved in the daily life of the home and the street is this:

While riding on a train, a person is in the care of others who are watching out for his safety at every turn. He has attendants to help him onto and off trains, cautioning him to "watch your step"; he has conductors, brakemen and engineers to operate the train, dispatchers to keep the way open, section gangs to keep the track in good shape and many other skilled and efficient hands to look out for the safety of the train and its passengers. That accidents should occur now and then through a breakdown of some human factor is inevitable, but the fact that so many millions ride in safety every year is a tribute to the high efficiency of railroad operation.

At home and on the street, a person is, so to speak, "on his own." He has nobody to look out for his safety and well being but himself, and the fact that so many thousands of injuries occur in these ordinary accident classes every day indicates very clearly how inefficient and careless the average individual is about taking care of himself.

As a matter of fact, on board a railway train is about as safe a place as a person can be. Out of the thousands of policyholders of the Provident, residing throughout the United States and traveling about the country on business and pleasure, the company has not paid out during the past year a single death claim on a railway passenger. This is quite remarkable when it is taken into consideration that this Chattanooga company has been paying claims this year at the rate of 4,600 a month and during the year has returned to policyholders in claims an amount totaling more than $1,800,000.

The Criminal

FRANCIS CARLIN, one of the chiefs of "Scotland Yard," in his book, "Reminiscences of an Ex-Detective," gives it as a result of forty years of experience with criminals, that:

"I heartily agree with the dictum, 'Make idleness impossible, and you have done much to make the criminal impossible,' and would go so far as to say that laziness and covetousness are at the root of all crime.

"From the earliest days our forefathers seem to have been warned of these things. Consider the proverb, 'Satan finds mischief for idle hands to do,' and consider also the tenth commandment, 'Thou shalt not covet thy neighbor's house, thou shalt not covet thy neighbor's wife, nor his manservant, nor his maidservant, nor his ox, nor his ass, nor anything that is thy neighbor's.'

"Why is it that with all our experience and all the warnings we have received we lust after idleness, cultivate laziness and covetousness, and with open arms invite our own destruction?"

Punch, Brothers, Punch!

MARK TWAIN (S. L. Clemens) once was so amused by a set of instructions to conductors relative to the procedure to be followed in collecting fares, which he saw posted in a railroad car, that he transposed them so as to form a mirthful jingle which later was used in *Literary Nightmare* and was further popularized by Isaac Bromley and others. It follows:

Conductor, when you receive a fare,
Punch in the presence of the passenjare,
A blue trip slip for an eight-cent fare,
A buff trip slip for a six-cent fare,
A pink trip slip for a three-cent fare,
Punch in the presence of the passenjare!

* * *

Punch, brothers! Punch with care!
Punch in the presence of the passenjare!

Clicks from the Rails

Bridge Without Rivet or Bolt

A steel railroad bridge, built without the use of a single rivet or bolt, was officially opened to traffic by the Boston and Maine at Chicopee Falls, Mass., March 17, last. All parts were joined by an electric arc-welding process. Great savings of time and money can be realized by the use of this method of bridge building, according to officials of the Westinghouse Electric and Manufacturing company, who supervised the construction. Time which under present methods is consumed in making rivet holes and driving the rivets is saved. Practically noiseless construction also is obtained. The absence of the many rivet holes, which weaken the girders, makes it possible to build a bridge at a saving of one-third of the material ordinarily used. Some parts commonly used are entirely omitted from the structure. Painting is also made easier and more effective due to the smooth surface, free from rivets and bolts.

* * *

Salvage Dry Cell Batteries

Dead dry cell batteries which would ordinarily find their way to the junk pile are being salvaged by the Southern Pacific. A specially designed machine strips them of their zinc shells, tears off the covers and separates the contents of the container. The zinc is used in the company's shops, and the brass screws, caps and rods are sold as scrap brass. Nearly 5,000 batteries are salvaged a month and each represents a saving of three-fourths of a cent. In a year, however, this seemingly insignificant item, together with other savings, amounts to a considerable sum.

* * *

Golf Also Wrecks A Railroad

Golf, old-homewrecker or wrecker of the old home, as the case may be, is now charged with playing fast and loose with a railroad. A three-mile line to a course in a Chicago suburb is in financial difficulty because automobiles have taken its passenger business. The line was subsidized by golfers. Golf has its widows no less renowned than war, but here, perhaps, is the first railroad to be reported among the casualties.—*Nation's Business.*

Save Youths From Head-on Smash

Four youths, aged fifteen to eighteen years, desiring to go to Ottawa but lacking the necessary means of transportation, stole a gasoline motor car and started on their journey. An alert telegraph operator noticed the car speed by his station and a semaphore indicating danger, and head toward a fast freight train coming from the opposite direction. Only fifteen miles separated the train and motor car. Police officers were notified and, obtaining a locomotive, gave chase. After an exciting race the boys abandoned the motor car and took to the woods nearby. The car was removed from the tracks a few minutes before the arrival of the freight train, and all the boys were captured.

* * *

N. Y. C. Pensions 735 Veterans

Forty-four out of 735 employes pensioned by the New York Central during 1927, had over fifty years of continuous service. Eight were retired enginemen with a total service of 419 years, or an average of fify-two years and seven months each. Seven pensioned conductors had an aggregate service of 362 years and nine months, an average of fifty-one years and nine months. Forty years of service were credited to more than 319 others. To these former employes a total of $2,330,359 was paid by the company during the year, bringing up the total of pensions paid since the system was inaugurated in 1910, to nearly $17,000,000.

* * *

Concrete Roadbed a Success

After a year of operation over a quarter-mile stretch of Pere Marquette track, laid on a concrete roadbed, it has been proven that this idea of a permanent right of way is practical. No wear or disintegration is noticeable to either rails or concrete. Trains running over this track ride more smoothly than over an ordinary roadbed. The sound of the train, while of no greater volume, differs from the familiar rumble heard on other tracks in that it has a metallic tone, due to the reflection of the sound from the hard, smooth surface underneath. There are no clicks, however, when the trucks pass over the rail joints.

Great Improvements Possible

Great improvements can be made by the railroads of the country along the lines of grade reductions, multiple tracking, elimination of curvature, construction of diversion lines around congested districts, and the extension of the use of block signals. Double and possibly triple-decking of facilities, particularly in the larger cities, were also named as possible solutions of the problems of railway expansion in the future by D. J. Brumley, chief engineer of the Chicago terminal improvements of the Illinois Central, in a talk before railway engineers in Chicago, March 6.

Electrification will continue to replace steam power in some places, he believes. It has great advantages over steam under conditions such as dense traffic, heavy grades, congested terminals, commutation service where frequent stops are made, and under covered areas.

* * *

Don't Like Locomotive Whistles

Residents of Beverly Farms, Mass., don't like locomotive whistles, for they have asked the Boston and Maine to discontinue their use when passing through the community. They have suggested that an electric bell, instead, be installed to notify the gateman of the approach of trains and have offered to pay half the costs of installation, which will amount to approximately $1,000.

* * *

Locomotive Bell Still Rings

Its days of usefulness at an end, the bell on the Southern Pacific's old locomotive No. 77 has been placed atop Mt. Rubidoux at Riverside, Cal., and dedicated as a landmark. Every morning a one-time pioneer, now a wealthy citizen of the community, climbs to the top of the mountain and rings the bell.

* * *

Last Wooden Passenger Cars

Attention is called to the item "Last of Wooden Passenger Cars," which appeared on Page 111 of the last issue of *The Bulletin*, for the reason that the sums of $20,000 and $21,000 were erroneously quoted and should have been $20,000,000 and $21,000,000.

A Toast

HERE is a toast I want to drink
To a fellow I'll never know;
To the fellow who's going to take my place
When it's time for me to go.

I've wondered what kind of a chap he'll be,
And I've wished I could take his hand,
Just to whisper, "I wish you well, old man,"
In a way that he'd understand.

I'd like to give him the cheerful word
That I've longed at times to hear!
I'd like to give him the warm handclasp
When never a friend seems near.

I've gained my knowledge by sheer hard work,
And I wish I could pass it on,
To the fellow who'll come to take my place,
Some time when I am gone.

(*Author Unknown*)